DOCUMENT RESUME

ED 188 329 EA 012 784

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TITLE Footnotes to Organizational Change. Project Report No. 80-A6.
INSTITUTION Stanford Univ., Calif. Inst. for Research on Educational Finance and Governance.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.; Spencer Foundation, Chicago, Ill.
PUB DATE Apr 80
NOTE 60p.; Paper presented at the Annual Meeting of the National Center for Higher Education Management Systems (Denver, CO, January 1980). Not available in paper copy due to marginal legibility of original document.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Adjustment (to Environment); Innovation; Organization; *Organizational Change; *Organizational Theories

ABSTRACT

Recent studies of innovation and change in organizations have included case studies of change (and the problems associated with it), cross-sectional and longitudinal analyses of secondary data, and efforts toward developing an empirically based theory of organizational change. The present paper is in that tradition, but it is substantially more modest. It examines five footnotes to change in organizations: (1) Organizations are continually changing, routinely, easily, and responsively; but change within them cannot ordinarily be controlled arbitrarily. (2) Changes in organizations depend on a few stable processes. (3) Theories of change in organizations are primarily different ways of looking at theories of action in organizations, not distinct theories. (4) Although organizational response to environmental events is broadly adaptive and mostly routine, it occurs in a confusing world. (5) Adaptation to a changing environment involves an interplay of rationality and foolishness. The argument in these interpretations is that simple processes of adaptation produce a rich mosaic of behavior and are sometimes surprisingly sensitive to the details of the context in which they occur; but the processes themselves can be seen as quite stable and, possibly, comprehensible. (Author/IRT)

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Institute for Research on Educational Finance and Governance

SCHOOL OF EDUCATION STANFORD UNIVERSITY

EA 012 784

Project Report No. 80-A6

FOOTNOTES TO ORGANIZATIONAL CHANGE

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April 1980

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This paper was prepared for delivery at the 1980 National Assembly sponsored by the National Center for Higher Education Management Systems and held in Denver, January 17, 1980. I am grateful for the assistance of Julia Ball; for the comments and collaboration of Vicki Eaton, Martha Feldman, Daniel Levinthal, Anne Miner, J. Rounds, Phillip Salin and Jo Zettler; and for grants from the Spencer Foundation and the National Institute of Education. The analyses and conclusions do not necessarily reflect the views or policies of this organization.

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Abstract

Recent studies of innovation and change in organizations have included case studies of change (and the problems associated with it), cross-sectional and longitudinal analyses of secondary data, and efforts toward developing an empirically based theory of organizational change. The present paper is in that tradition, but its intention is substantially more modest. It examines five footnotes to change in organizations. These footnotes emphasize the relation between change and adaptive behavior more generally, the prosaic nature of change, the way in which ordinary processes combine with a confusing world to produce some surprises, and the implicit altruism of organizational foolishness.

1. INTRODUCTION

Organizations change. They grow; they decline. They prosper; they fail. Though they often appear resistant to change, they are frequently transformed. Objectives, activities, and organizational structure change; and organizations sometimes drift into forms remarkably different from the original. In recent years, research efforts to understand the specific historical events associated with particular organizational changes[1] have been supplemented by more comprehensive attempts to identify general factors affecting change in organizations. In this spirit, for example, we have analyses of technological change,[2] research and development expenditures,[3] innovations,[4] and organizational growth and decline.[5] Such studies, in turn, have stimulated a number of efforts to develop empirically-grounded theories of change.[6] As a result of this work some early, simple speculations about change[7] have been found to need qualification, modification and elaboration, although some elements of those ideas continue to appear robust.[8]

It is not my intention to summarize that work in any comprehensive way. It has been reviewed in several places that are readily accesible.[9] My objectives are considerably more modest. I want to explore the meaning and significance of five general footnotes to organizational change. The footnotes are, I believe, reasonable comments on the empirical and theoretical literature; but my colleagues should not be burdened with direct responsibility for them. Although the footnotes are presented as a possible commentary on what we know, my primary intention is not to review research results but to identify a few small speculations that are provoked by previous work.

Footnote 1: Organizations are continually changing, routinely, easily and responsively; but change within them cannot ordinarily be controlled arbitrarily. Organizations rarely do exactly what they are told to do.

Footnote 2: Changes in organizations depend on a few stable processes. A theory of change can emphasize either the stability of the processes or the changes they produce; but to understand organizations in a serious way, we require theories that attend to both.

Footnote 3: Theories of change in organizations are primarily different ways of looking at theories of action in organizations, not distinct theories. Most changes in organizations reflect simple

adaptive responses to demographic, economic, social, and political forces.

Footnote 4: Although organizational response to environmental events is broadly adaptive and mostly routine, it occurs in a confusing world. As a result, prosaic processes sometimes result in surprising outcomes.

Footnote 5: Adaptation to a changing environment involves an interplay of rationality and foolishness. Organizational foolishness is not maintained as a conscious strategy, but is embedded in such familiar organizational anomalies as slack, managerial incentives, symbolic action, ambiguity, and loose coupling.

Since none of these comments is necessarily immediately obvious, I intend to elaborate them somewhat in the remainder of the paper. In the end, however, I cannot claim more than that they are possible comments on a few familiar phenomena, comments with some implications for understanding organizational change, but more an interpretation than a theory. Thus, properly labeled as footnotes.

2. ORGANIZATIONS AND CHANGE

One of the most common themes in recent literature, particularly in studies of the implementation of public policy, is the story of hopes for change frustrated by organizational resistance. There are innmerable, well-documented occasions on which organizations have failed to respond to change initiatives, or have changed in ways that are, by some views, inappropriate.[10] The contumacies of organizations in the face of sensible efforts to change them fill our anecdotes and our case studies.

What most tales of implementation tell us, however, is not that organizations are rigid and inflexible. Quite the contrary. They picture organizations as impressively imaginative.[11] Organizations change in response to their environments, including their managements; but they resist doing exactly what they are told. As a result, they rarely change in a way that fulfils the intentional plan of a single group of actors.[12] Sometimes organizations ignore clear instructions; sometimes they pursue them more forcefully than was intended; sometimes they protect policy makers from the folly of foolish policy; sometimes they do not. They are not neutral instruments responding passively to any arbitrary command that might be given. Contemporary history is testimony to the proposition that if leadership wants to make arbitrary changes, neither bureaucracies nor armies are notably easier to control from the top than is a populace of unorganized citizens.

The ability to frustrate arbitrary intention, however, should not be confused with rigidity. Organizations change frequently. They adopt new products, new procedures, new objectives, new postures, new styles, new personnel, new beliefs. Even in a rather short perspective, the changes are often large. Most organizations can write histories that identify the continuity of tradition and form. There is considerable stability; but the changes are substantial enough to suggest that organizations are remarkably flexible, enduring examples of conspicuously changing institutions, adapting to volatile environments routinely and easily much of the time.

In most ordinary senses of change, organizations are like the weather, changeable enough to animate casual conversations, steady enough to make the conversations repititious. The changes we experience in weather are the result, we usually assume, of some (relatively) stable climatic processes. We can emphasize either the stability of the processes or the variations they produce; but to understand weather in a serious way, we we need both. Organizational change can be viewed in a similar way. The changes we observe in organizations as they attend to their activities, their patterns of growth and development, and their adaptation to the environment are heavily dependent on some (relatively) stable processes of change. We can emphasize either the stability of a few basic adaptive processes or the changes they produce; but understanding organizations in a serious way requires both.

3. STABLE PROCESSES OF CHANGE

Most change in organizations is the result neither of extraordinary organizational processes or forces, nor of uncommon imagination, persistence or skill. It is a result of relatively stable processes that relate organizations to their environments. It occurs because most of the time most people in an organization do approximately what they are supposed to do, and what they are supposed to do is to be intelligently attentive to their environments and their jobs. Bureaucratic organizations are not always efficient. They can be exceptionally obtuse. But most of the organizations we study are characterized by ordinary competence and minor initiative.[13] They may not always change in ways we like, but they exhibit an impressively decentralized capability for changing as a matter of routine.

Routine behavior can easily lead to dramatic results. Because of the magnitude of some changes, we are inclined to look for comparably dramatic explanations; but efforts to develop more general theories of change suggest that the search for drama may often be a mistake.[14] Organizational

histories are written in dramatic form, and the drama reflects something important about the orchestration and mythology of organizational life; but substantial change results easily from the fact that many actions by an organization are conditional on its environment. Many of the most stable rules in an organization are rules for responding to economic, social and political contexts. If the environment changes rapidly, so will the response of stable organizations. Exogenously driven change will be dramatic if exogenous shifts are large.

The routine processes of organizational adaptation are subject to some complications, and a theory of change will need to be attentive to the ways in which those processes can produce unusual patterns of behavior; but a theory of organizational change should not be remarkably different from a theory of ordinary action. Recent efforts to understand organizations as routine adaptive systems emphasize five basic perspectives for interpreting organizational action:

> (1) Action can be seen as the application of standard operating procedures or other rules to appropriate situations. The underlying process is one of matching a set of rules to a situation by a criterion of appropriateness. The terms of reference are duties, obligations and roles. The rules and criteria evolve through competition and survival. Rules and criteria exhibited by organizations that survive, grow and reproduce come to dominate the pool of procedures that exist. The model is essentially a model of selection.[15]

(2) Action can be seen as problem solving. The underlying process is one of selecting among alternatives by using some decision rule that compares alternatives in terms of their expected consequences for antecedent goals. The model is one of intendedly rational choice under conditions of risk and is familiar to statistical decision theory, as well as micro-economic and behavioral theories of choice.[16]

(3) Action can be seen as stemming from past learning. The underlying process is one in which an organization modifies its propensities for various actions on the basis of inferences drawn from past experiences. The model is one of experiential learning in which behavior is conditioned through trial and error.[17]

(4) Action can be seen as spreading from one organization to another. The underlying process is one in which variations in contact rates and virulence of a behavior or belief being imitated affect the rate and pattern of spread. The model is one of diffusion and borrows from studies of epidemiology.[18]

(5) Action can be seen as stemming from the mix of intentions and competences found in organizational actors. As organizations experience turnover, new members with different attitudes, abilities, and goals replace old members. The underlying process is one in

which conditions in the organization (e.g., growth, decline, changing requirements for skills) or deliberate strategies (e.g., cooptation, raiding of competitors) affect organizational action by changing the mix of participants. The model is one of regeneration.[19]

These five perspectives see an organization as coping with its environment, actively adapting to it, avoiding it, seeking to change it, comprehend and contain it. An organization is neither unconditionally rigid nor unconditionally malleable; it is a relatively complicated collection of interests and beliefs acting in response to conflicting and ambiguous signals received from the environment and from the organization, acting in a manner that often makes sense and usually is intelligent. They evolve; they solve problems; they learn; they imitate; they regenerate. Under a variety of circumstances, the processes are conservative. That is, they tend to maintain stable relations, sustain existing rules, and reduce differences among similar organizations. But the fundamental logic is not one of stability in behavior; it is one of adaptation. The processes are stable; the resulting actions are not.

The five models are not esoteric. They are not complicated. The metaphors they provide can, however, contribute to understanding change in organizations in more systematic and precise terms than those suggested by an emphasis on change as an unusual and unique set of events. They link understandings of growth to understandings of decline, interpretations of

success to interpretations of failure. And they invite exploration of ways in which these ordinary modes of adaptation are confounded by circumstances and complications arising in every day life.

4. SOME COMPLICATIONS OF CHANGE

Organizations change by adapting to their environment in the mundane ways described above. However, these elementary processes of change are complicated in a confusing world. Organizations adapt, but sometimes locally sensible adaptations produce surprises. Problems are solved by searching for solutions, but sometimes history is better described as solutions looking for problems. Organizations innovate and imitate, but both innovations and organizations change their character in the process. Organizations respond to their environments, but they also participate in creating their environments. Organizations struggle to survive, but those struggles are entangled with the simultaneous struggles of individuals and larger systems of organizations.

Understanding these complications is as much a part of a theory of change as are the fundamental models. As illustrations of such complications,

consider five examples: the simple pathologies of ordinary action, the ways in which solutions search for problems, the tendency for innovations and organizations to be transformed during the process of innovation, the endogenous nature of created environments, and the interactions among the system requirements of individuals, organizations and environments.

Complication 1: Simple Pathologies of Ordinary Action

Each of the perspectives on action described above pictures an active, changing organization. For the most part, each portrays organizations that change sensibly. That is, organizations are seen as evolving in such a way as to emphasize procedures associated with success, as solving problems, as learning from their own experience, as copying others, and as regenerating their capabilities through turnover of personnel. The behavior is both conventional and intelligent.

Each of the processes, however, sometimes leads to results that seem perverse. There are simple pathologies of ordinary action. What distinguishes these pathologies is that normal adaptive processes interact with other factors in a way that undermines their sensibility, or changes the rate and direction of change in a relatively dramatic way. The usual processes are applied under conditions that though difficult to distinguish from standard conditions are, in fact, sufficiently different to make the

outcomes distinctive. We can identify three such conditions:

First, the adaptation rate may be inconsistent with the rate of change of the environment to which the organization is adapting. Unless the environment is perfectly stable, of course, there will always be some error arising from a history-dependent process; but where the environment changes quickly relative to the adaptation rate, the process can easily lose its claim to sensibility. Learning, problem solving, selection, diffusion, and regeneration all have capability for adapting to an environment, provided the rate of change in the environment is not too fast.

Second, the causal structure may be different from that implicit in the process. If causal links are ignored, either because they are new, or because their effects in the past have been benign, or because the world is inherently too complicated, then locally intelligent adaptations may produce unusual consequences. Since most adaptations involve some inferences about the way the world is organized causally, adaptation is particularly vulnerable in situations in which a false or incomplete model of causality is reinforced by confounded experience.

Third, parallel micro processes of prima facie sensibility may combine to produce outcomes that are not intended by anyone, and are directly counter to the interests motivating the action at the micro level. They

stimulate what the organization is trying to avoid; they obstruct what the organization is trying to accomplish; they make normally sensible action less than sensible. At least in the short run, they create difficulties that are unanticipated and paradoxical.[20]

These "pathologies" of change are not the rule. Most of the time they are avoided. But they are common. Consider the following brief illustrations:

(1) Learning from the response of clients. Clients send signals to organizations, the most conspicuous one being the removal of their patronage. As a result, we expect organizations to learn from such signals and to adjust action. For example, customer exit is a major device used by the market to maintain product quality. However, it may not work. As Hirschman[21] observes, it is likely that the first customers to abandon a product of declining quality will be those customers with the highest quality standards. As a result, the firm is left with customers whose standards are, on average, lower and who complain less about the reduced quality. This leads to further decay of quality, and the cycle continues. In this kind of situation, regeneration involves a fairly rapid change in the composition of the organization's clientele and thereby a rapid degradation in product or service.

(2) Rewarding friends and coopting enemies. One frequent feature of the relation between governmental regulatory agencies and the organizations they regulate is the possibility for employees of the former to become employees of the latter. The usual presumption is that expectations of future employment lead current governmental officials to treat the organizations involved more favorably than would otherwise be likely. However, if the regulated organizations provide employment incentives for favorable treatment, they risk producing a pattern of turnover in the regulatory agency in which friends leave the agency, and only those unfavorable to the organization remain. Alternatively, some organizations attempt to coopt difficult people. The procedure is familiar to modern theories of social movements. In general, it is assumed that cooptation leads to change, but controlled change, as opponents are socialized and provided with modest elements of success. The dynamics are somewhat more complicated, however. The basic strategy of cooptation is to strip leadership from opposition groups by inducing opposition leaders to accept more legitimate roles. The conspicuous complication is the extent to which a pattern of cooptation provides incentives for being difficult, and thus stimulates, rather than reduces opposition.

(3) Competency multipliers. Organizations frequently establish procedures to involve relevant people in decision making, planning, budgeting, or the like. The groups involved are composed of

individuals with roughly equal knowledge about a problem and roughly equal interest in it. As a result, participation is initially fairly equal. However, the initial small variations rather quickly become large. Individuals who participate slightly more than others become slightly more competent at the problems of the group than others. This induces them to participate even more, which makes them even more competent. Participation increases competence; competence increases participation. Before long, the de facto composition of the group has changed dramatically.[22] More generally organizations (and the people in them) learn from experience. They repeat actions that are successful. As a result of the repitition, they gain greater experience in areas of success than in areas of failure. This increases their capabilities in the successful areas, thus increasing their chances of being successful there. The process is the familiar, and generally sensible, one of specialization. But its sensibility depends on the relation between the learning rates narrowing attention and abilities, on the one hand, and the rate of change in the environment. The process can easily lead to misplaced specialization in a world in which there are infrequent, major shifts in the environment.

(4) Satisficing. It has been suggested that organizations satisfice, that is, that they seek alternatives that will satisfy a target goal rather than look for the alternative with the highest

possible expected value.[23] Satisficing organizations can be viewed as organizations that maximize the probability of achieving their targets, but it is not necessary to assume quite such a precise formulation to suggest that organizations that satisfice will follow decision rules that will be risk averse in good times (when the best alternatives have expected values greater than the target) and risk seeking in bad times (when the best alternatives have expected values less than the target).[24] Such a pattern of behavior has at least two important consequences for students of organizational change. First, organizations that are facing bad times will follow riskier and riskier strategies, thus simultaneously increasing their chances of survival and reducing their life expectancy (if they do not survive). Choices that seek to reverse a decline, for example, will generally not maximize expected value. As a result, for those organizations that die, the attempt to survive will have speeded the process of death.[25] Second, since organizational goals adapt to organizational performance and to the performance of other comparable organizations, most organizations most of the time face situations that are reasonably good. Consequently, the pool of organizations existing at any time will generally include a disproportionate number that are risk averse. The system of organizations will depend heavily on failing (or foolish) organizations to explore risky alternatives.

(5) Performance criteria. Organizations measure the performance of participants. For example, business firms reward managers

on the basis of calculations of profits earned by different parts of the organization. The importance of making such links precise and visible is a familiar theme of discussions of organizational control, as is the problem of providing similar performance measures in non-business organizations. The conventional ideology, however, interacts with some features of organizations to produce unanticipated effects. It probably leads to a relative lack of concern about long-term consequences of present action in an organization with a typical mobility pattern among managers. Unless the rewards associated with performance are tied to the long term, an emphasis on measuring and rewarding managerial performance becomes an emphasis on the short run, particularly among managers who expect to be promoted away from their present positions. It also leads to exaggerated concern with accounts, relative to a concern with product and technology. Measured performance can be improved either by changing the world or by changing the accounts of the world. It is often more efficient, in the short run, to devote effort to the accounts rather than to the world.[26] The result is that precise performance criteria tend to undermine operations in the name of accounts. The tendency has limits, but a bottom line ideology has costs associated with the cleverness of organizational participants in manipulating accounts.

(6) Superstitious learning. Organizations learn from their experience, repeating actions that have been associated with good

outcomes, avoiding actions that have been associated with bad ones. But the intelligence of associational, experiential learning depends on the implicit assumption that the world makes simple sense. If the world makes simple sense, and is stable, then repeating actions associated with outcomes we like is intelligent. But relative to the rate of our experience in it, the world is sometimes neither stable enough nor simple enough to make experience a good teacher. Yet, we use it; and those ordinary processes of association result in superstitious learning.[27] Consider, for example, the report by Tversky and Kahneman[28] of the lessons learned by pilot trainers. Trainers tell interviewers that they have experimented with rewarding pilots who make good landings and punishing pilots who make bad ones. They observe that pilots who are punished generally improve on subsequent landings, while pilots who are praised generally do worse. Thus, they conclude that negative reinforcement works; positive reinforcement does not. The learning is natural, but the experience, like all experience, is confounded, in this case by ordinary regression to the mean. In general, learning from experience is a powerful and useful tool of organizational change; but it will often lead to learning that is superstitious, incomplete, or obsolescent.[29]

These six examples of simple "pathologies" are illustrative of the rich variation in behavior that can be generated by elementary adaptation under

special conditions. They suggest some ways in which undramatic features of organizational life can lead to surprising episodes of organizational change.

Complication 2: Solutions Looking for Problems

The most common ideas about organizational action see change as occuring in response to a problem; and there seems ample evidence that when performance fails to meet aspirations, organizations search for new solutions.[30] They look for new people, new ways of doing things, new alliances. Many observations on innovation and change, however, do not seem to fit well into such a view of change. Changes often seem to be driven less by problems than by solutions. Answers often precede questions. Recently, Daft and Becker have argued the case for educational organizations[31] and Kay for industrial organizations;[32] but the idea is an established one, typical of diffusion theories of change.

We can identify at least three different explanations for solution (or opportunity) driven change. The first sees organizations as facing a large number of problems of approximately equal apparent importance. The practical reality is that there are many problems but only a few solutions. Thus, the chance of locating a solution to any arbitrary problem is small. On the other hand, if one begins with a solution, there is a good chance that that solution will match some problem facing the organization. Consequently, an organization scans for solutions rather than problems, and matches any

solution found with some relevant problem.

It is not necessary to assume that problems are many and solutions few to see change as coming from solutions, however. A second explanation notes that the linkage between individual solutions and individual problems is often difficult to make unambiguously. Then, (almost) any solution can be linked to (almost) any problem, provided they arise at approximately the same time.[33] When causal and technological structures are ambiguous, the process of decision making consists of solutions looking for problems as well as problems looking for solutions, and the motivation to have particular solutions adopted is likely to be as powerful an organizational desire as the motivation to have particular problems solved. The symmetry in search means that many of the changes we observe will be stimulated by a prior solution, rather than by a prior problem.

A third interpretation sees change as being stimulated not by adversity but by success, not by a sense of problems but by a sense of competence. In this view, change is produced by a belief that change is possible, natural, and appropriate.[34] Professionals change their procedures because that is what professionals do and know how to do. Engineers use new technologies because that is what makes a good engineer. An organization that is "modern" adopts new things because that is what being modern means. People accustomed to success innovate. Of course, when a major stimulus for change comes from success and a sense of competence, it is often necessary for

the organization to comprehend the process in terms of a problem solving metaphor. As a result, "problems" are created in order to "solve" them. Solutions and opportunities stimulate awareness of previously unsalient or unnoticed problems or preferences.

The three explanations are rather different, but they share a common surveillance conception of information in organizations. Most modern theories of information in organizations are linked to theories of decision in which the value of information is measured by its expected contribution to resolving choices among alternatives evaluated in terms of prior goals. Such theories lead to information strategies that emphasize searching for information to resolve uncertainties in estmates of future outcomes. Solution-driven perspectives on change produce a different image. Rather than an analyst looking for specific data, we are inclined to think of a monitor looking for unusual signals. Surveillance views of information in organizations seem to fit organizational behavior that is rather badly understood within a decision framework.

Complication 3: Transformation of Innovations and Organizations

One persistent difficulty facing students of innovation in organizations is the tendency for both innovations and organizations to be transformed during the process. This is sometimes treated as a methodological or measurement problem. In that guise, the problem is to decide whether a change in one organization is equivalent to a change in another; or to determine when a change has been implemented sufficiently to be considered a change; or to disentangle the labeling of a change from the change itself. To treat such problems as observational problems, however, is probably misleading. Seeing innovations or inventions as invariant, spreading unchanged through organizations helps link studies of innovation to models drawn from epidemiology. But where a fundamental feature of a change is the way it is transformed as it moves from invention to adoption to implementation to contagion, our problem is not an observational one but a conceptual one.

Change unfolds in an organization, developing meaning through the process by which it occurs. Some parts of that process act to standardize the meaning of a change and to develop consistency; but standardization can be very slow, in some cases so slow as to be almost undetectable. When a prison system adopts a new paradigm,[35] a business firm a new policy,[36] or a university a new program,[37] we know that specifying what the change means (or is) can be difficult. The difficulty is not a result of poor information or inadequate analysis. It comes from the fundamental ways in

which changes are transformed by the processes of change. The unfolding character of change makes it difficult to use standard ideas of decision, problem solving, imitation, and the like. Such metaphors depend on being able to describe a decision, problem solution, or innovation with some precision; to say when it was adopted; and to treat the process as having a clear outcome. Often, our studies of organizational change do not show such finality.

Organizations are transformed in a similar way. Organizations are often created to accomplish a purpose, but organizational design is usually more like locating a snow fence to deflect the drifting snow than like building a snow man. In the beginning, perhaps, someone has a goal; but organizations develop and redefine goals while making decisions and adapting to environmental pressures. An organization of evangelists becomes a gym with services attached.[38] A social movement becomes a commercial establishment.[39] A radical rock radio station becomes an almost respectable part of a large corporation.[40] A new governmental agency becomes an old one.[41] As a result, minor changes can lead to more fundamental ones, and the initial intent can be entirely lost in the process. This is particularly visible in the early life of an organization.[42]

These transformations seem often to reflect occasions on which actions taken by an organization (for whatever reason) become the source of a new definition of objectives. The possibility that preferences and goals may often change in response to behavior is well known to students of child

and adult development. It is a serious complication for rational theories of choice.[43] Organizational goals, as well as the goals of individuals in them, change in the course of introducing deliberate innovations, or in the course of normal organizational drift. As a result, actions affect the preferences in the name of which they are taken; and the discovery of new intentions is one of the most common of consequences of intentional behavior.

Complication 4: Created Environments

Simple models of adaptation usually assume that the environment is exogenous, that action is taken in response to the environment, but that the environment is not affected by action. The assumptions are convenient, but they are clearly wrong in important ways. Organizations create their environments in part, and the resulting complications for understanding adaptive processes are substantial. Consider, for example, the following:

> Ecologies of competition. Organizations are frequently combined into an ecology of competition in which the actions of one competitor become the environment of another. Each competitor, therefore, partly determines its own environment as the group of competitors reacts to each other. The situation is familiar to studies of prey-predator relations and markets.[44]

Mutual learning. If we think of experiential learning as consisting in an adaptive organzation learning about a fixed environment, the model is somewhat different from one in which the environment is simultaneously learning from the actor. The situation is a common one. Parents train children at the same time as children train parents. Customers and suppliers train each other. The equilibria of mutual learning depend critically on whether the process is one of "hunting" or "mating" and on the relative rates of adaptation of the two learners, but they lead to a set of outcomes different from those observed in the case of adaptation to a stable world.[45]

Enactment processes. Organizations, and the individuals in them, create their own environments by the way they interpret and act in the confusing world they find around them. It is not just that they perceive the world in an incomplete or inaccurate way, although they certainly do that.[46] The critical feature of enactment is that the actions taken as a result of beliefs about the world do, in fact, construct the environment. Enactment processes include such familiar things as self-fulfilling prophecies and the construction of limits through avoidance of them.[47]

It is possible, of course, for organizations to act strategically upon a world they help create, conscious of the complications. But often they do not. Created environments are not ordinarily experienced in a different way from exogenous ones. For example, learning in a situation involving

mutual learning is not experienced in a way remarkably different from learning in simpler situations. What is distinctive when environments are endogenous is that the actions taken by an organization in adapting to an environment are partly responses to previous behavior by the same organization, reflected back through the ecological structure. A common result is that small signals are amplified into large ones. The general implication is that routine adaptive processes have consequences that cannot be understood without linking them to an environment that is simultaneously, and endogenously, changing.

Complication 5: Individuals, Organizations and Environments

Although it is an heroic simplification out of which theoretical mischief can come, it is possible to see an organization as the intermeshing of three systems: The individual, the organization, and the collection of organizations that can be called the "environment". Many of the complications in the study of organizational change are related to the way those three systems fit together. This is reflected in the large number of studies and treatises that discuss managing change in terms of the relations between organizations and the individuals who inhabit them,[48] organizations and their environment,[49] and inter-organizational relations.[50]

Much of classical organization theory addresses the problems of making the simultaneous system requirements of organizations and individuals

consistent;[51] and the same theme is frequent in modern treatments of information[52] and incentives[53]. Similarly, classic theories of international relations, particularly balance of power formulations, are concerned with finding equilibrium solutions to the simultaneous demands of interconnected nations;[54] and classic economic theories of markets seek equilibria defined in terms of satisfying the requirements of participants in a system of exchange.[55] It is an old problem.

It continues to be an interesting complication for the analysis of organizational change. In particular, it seems very likely that both the individuals involved in organizations and the system of organizations have different requirements for organizational change than the organization itself. Two standard examples:

> Individual desires for stability and variety. Individual participants in an organization see their positions in the organizations (e.g., their jobs) as an important part of their milieu. They try to match the patterns of stability and variety that arise within the organization to their individual senses of individual needs. However, there is no particular a priori reason for assuming that an individual's desires for change and stability will match organizational requirements precisely -- or even approximately.
>
> System needs for risk-taking and turnover. The survival of an individual organization is a more compelling requirement for the

organization than it is for a system of organizations. The larger system may require changes that are inappropriate from the point of view of the individual organization. Or it may require greater rigidity. It will generally profit from organizational death and birth rates somewhat different from those that are optimal for individual organizations.

Complications such as these are common in any combination of (somewhat) autonomous systems. They form a focus for some standard issues in contemporary population genetics,[56] as well as extensions of those ideas into social science in general[57] and organization theory in in particular.[58] There is no guarantee that the present systems of individuals, organizations, and environments that we observe have evolved to a state that is in equilibrium; but it is likely that some of the features about orgazations that sometimes seem particularly perverse make greater sense when considered from the point of view of the larger system of organizations.

Each of the complications discussed above can be seen either as identifying a shortcoming in one of the standard models, or as an illustration of some ways in which models of adaptation can be used to illuminate organizational change under complicated or confounded conditions. For example, the models of learning used to examine superstitious learning are identical to the ones used to examine ordinary learning. They show that superstitious behavior can result from procedures that, under most conditions, lead to sensible

adaptation to experience. Other illustrations of complications could easily be added to the short list discussed above. There are problems introduced by the ways in which humans make inferences,[59] and by the ways in which organizational demography affects regeneration.[60] And so on. In each case, the fruitfulness of a standard model is extended by exhibiting how familiar activities, rules or procedures lead to unanticipated consequences. Establishing such links between a few fundamental processes of change and events of surprising change is one way of coming to understand organizations.

5. FOOLISHNESS, CHANGE AND ALTRUISM

As the earlier discussion of individuals, organizations, and environments suggests, adaptive organizations face a problem in maintaining some kind of reasonable balance (or dialectic) between explicitly sensible processes of change (problem-solving, learning, planning) and certain elements of foolishness that are difficult to justify locally, but are important to the broader system. Discussions of the relation between local and global rationality are extensive in social welfare economics,[61] and population biology.[62] Those discussions have their counterparts here.

Consider, for example a classic complication of long run planning. As we try to anticipate the future, we will often observe that there are many possible future events about which we can say: Each event, if it were to occur, would dramatically change the consequences of present actions, thus the appropriate choice to be made now; but each event is extremely unlikely. Because there are so many very unlikely future events that can be imagined, and each is so improbable, we ordinarily exclude them from our more careful forecasts. We leave such things to the pop prophets of life, knowing that they are almost always wrong. At the same time, however, we know that some very unlikely events will certainly occur. As a result, our plans are based on a future that we know, with certainty, will not be realized.

The scenario is a common one. Intelligent behavior involves avoiding alternatives that have low expected values. If the favorable outcomes of a particular alternative depend on the occurence of very unlikely events, the expected value of that alternative will be appropriately low. But although any particular unlikely event is very unlikely, the chance that no unlikely event will occur is zero. Thus, the best alternative (ex post) is very unlikely to be discovered (ex ante). For similar reasons, the prior expected value of any specific innovation is likely to be appropriately negative, and organizations are likely to be resistant to proposals for such change. Indeed, we would expect that an institution eager to adopt innovative proposals will survive less fulsomely and for shorter periods than others. Though some unknown change is almost certainly sensible, being the first to try a risky new idea

is unlikely to be worth the risk.

However, it is in everyone's interest to have someone else run the experiment. Thus, the problem becomes one for the system of organizations, rather than a single organization. How are foolish new ideas introduced into sensible organizations at a rate sufficient to sustain the larger system of organizations, in the face of the fact that such foolishness is not ordinarily intelligent for any one organization? The conventional solution for such problems involves some kind of collaboration that pools the risk.[63] Explicit risk-sharing agreements exist; but for the most part, organizational systems have evolved a culture of implicit altruism that introduces decentralized non-rational elements into rational choice procedures rather than relying on explicit contractual arrangements.

These cultural elements of manifest foolishness have latent implications for innovation and change in organizations. New ideas are sustained in an organization by a set of mechanisms that shield them, altruistically, from the operation of normal rationality. Thus:

> Organizational slack. Slack protects individuals and groups who pursue change for personal or professional reasons from normal rational controls. As a result, Cyert and March suggested that one of the ways in which organizations "search" when successful is through slack.[64] Similar arguments can be found in Knight,[65] Elliott,[66]

and Wilson.[67] Evidence for the slack search hypothesis is mixed. Several studies of change seem to lend support;[68] and Mansfield finds results that can be interpreted as supportive;[69] but Kay concludes that it is hard to see signs of slack search consistently in the data on research and development expenditures.[70] Daft and Becker suggest that slack is associated not with excess resources but with high salaries (and the high level of professionalism they bring).[71]

Managerial incentives. Since managers and other leaders are selected by a process that is generally conservative,[72] it is probably unreasonable to see them as a source of intentional foolishness. Moreover, at first blush, managerial incentives seem unlikely to stimulate managerial playfulness. Incentive schemes try to tie individual rewards to organizational outcomes. Managers help themselves by helping the organization. Such a view is, however, incomplete. The ideology of good management associates managers with the introduction of new ideas, new organizational forms, new technologies, new products, new slogans, or new moods. Managers expect, and are expected, to leave their marks. Consequently, they try. And some fraction of organizational resources is dedicated, in effect, to running unlikely experiments in changes as unwitting altruistic contributions to the larger world.

Symbolic gains. Choice and decision making are major domains of symbolic concern, touching on some of the more important values of modern developed cultures. Innovation and change are important aspects of that symbolism. As several writers have noted, symbolic values are important enough, and pervasive enough to dominate other factors in a decision situation.[73] Symbolism shades into personal motivations easily when we are dealing with professionals (e.g., engineers, doctors) or managers. Managers and professionals symbolize their competence and authority by the introduction of changes, or symbols of changes.[74] In a more general way, the elaboration of choice processes becomes more important than the outcomes; and the choices, thus, reflect more irrelevant foolishness than would otherwise be expected.

Ambiguity. Organizations do not always have a well-defined set of objectives. Their preferences are frequently imprecise, inconsistent, unstable, and endogenous.[75] As a result, problem solving and decision making assume some of the features of a garbage can process,[76] learning becomes confounded by the ambiguity of experience,[77] and actions become particularly sensitive to the participation and attention patterns of organizational actors.[78] Theories of choice under risk emphasize the uncertainties involved in trying to guess the future consequences of present action. Ambiguity introduces additional uncertainties associated with the difficulty of trying to guess future preferences.[79] The result is to increase

considerably the variance in any estimates that might be made of the expected utility of present action, and thus to decrease the reliability of the process.

Loose coupling. Bureaucratic organizations are complex combinations of activities, purposes, and meanings. They are remarkably integrated and impressively coordinated. Modern systems of organizational management accomplish coordinated tasks that would be inconceivable without them. Bureaucracy is not the only mode of complex coordination;[80] but it is one without which it is difficult to imagine a modern developed society. But the impressive integration of formal organizations should not obscure the many ways in which organizations are loosely coupled. Behavior is loosely coupled to intentions; actions in one part of the organization are loosely coupled with actions in another part; decisions today are loosely coupled with decisions tomorrow.[81] These features do not appear to be remediable. Rather, limits on coordination, attention, and control are endemic restrictions on the operation of conscious rationality in organizational action.

These organizational phenomena assure that some level of foolishness will occur within a formal organization, no matter how dedicated to rational coordination and control it may be. Although it is easy to argue that foolishness is a form of altruism by which systemic needs for change are met, it is much harder to assess whether the mixture of rationality and foolishness

that we observe in organizations is optimal. It is probably plausible to argue that the ideology underlying the development of decision engineering underestimates the importance of foolishness, and that the ideology underlying enthusiasts for some versions of undisciplined creativity underestimates the importance of systematic analysis. What is much more difficult is to determine whether a particular real system, as it functions, errs on the side of excessive reason or excessive foolishness. We can solve the problem of appropriate foolishness within a specific model. It requires that we be able to specify some characteristics of the environment over the future. Solving the problem in a real situation, however, is not ordinarily within our ability. We do not have the relevant information.

Nor is it easy to devise realistic insurance, information, or contractual schemes that will reliably assure reaching an optimum. The difficulties in analysis are substantial; but quite aside from those problems, there is a difficulty posed by the cultural character of the existing solution. The mix of organizational foolishness and rationality is deeply embedded in the procedures, incentives, and beliefs of the society and organization. It cannot be treated as a simple choice to be made and implemented --- even if we could solve the problem analytically. It is possible to imagine changing the mix of procedures, and thereby changing the level of foolishness; but it is hard to imagine being able to modify such broad cultural and organizational attributes with much precision or much control.

4. CONCLUSION

The five small footnotes to organizational change suggested at the outset are neither unusual nor comprehensive. They are comments on change, not a theory of it. Nevertheless, they have some modest implications for organizational leadership and for research on adaptation in organizations. The general perspective depends on the proposition that the basic processes by which organizations behave, respond to their environments, and learn are the same under quite different circumstances. The argument is not that decline is a mirror of growth, nor that failure looks like success. It is that simple processes of adaptation produce a rich mosaic of behavior and are sometimes surprisingly sensitive to the details of the context in which they occur; but the processes themselves can be seen as quite stable, and possibly comprehensible.

A view of change as resulting from stable processes realized in a highly contextual and sometimes confusing world emphasizes the idea that things happen in organizations because organizational participants most of the time adapt in elementary ways to the environment, including that part of the environment that might be called management or leadership. Organizations

change, in part, because managers and leaders do what managers and leaders are supposed to do. They propose changes, including foolish ones; they try to cope with the world and to control it; they respond to other members of the organization; they issue orders and manipulate incentives. They play conventional roles. Because the roles are conventional, it is tempting to conclude that leadership in unimportant to organizational change; and there are senses in which such a conclusion fits the facts better than a more heroic vision. The price of legitimacy as a leader is some reliability in behavior. Organizational leaders are not likely to want to behave in strikingly unusual ways; they are selected in a manner that eliminates most oddities. And if by some chance, a leader tries to march toward strange destinations, an organization is likely to deflect the effort.

The argument can easily be overdone, however. Simply to describe leadership as conventional and constrained by organizational realities is to risk misunderstanding its importance. Organizations function conventionally. Changes occur routinely. Neither success nor innovation requires dramatics. What organizations require is that ordinary people do ordinary things in a competent way.[82] Breathing is a routine activity also, and not thereby deprived of significance for sustaining life. Moreover, within some broad constraints, the adaptiveness of organizations can be managed. Typically, it is not possible to lead an organization in any arbitrary direction that might be desired; but it is possible to influence the course of events by managing the process of change, and particularly by stimulating or inhibiting

predictable complications and curious dynamics.

But such a vision of managing organizations is a relatively subtle one. It assumes that organizations are to be sailed rather than driven, and that the effectiveness of leadership often depends on being able to time small interventions so that the force of natural organizational processes amplifies the interventions rather than dampens them. It is possible to identify a few minor rules for such actions;[83] but a more serious development of managerial strategies (as well as of effective strategies for frustrating managers) requires a more thorough understanding of change in organizations. Not a theory of how to introduce any arbitrary change, but a theory of how to direct somewhat the conventional ways in which an organization responds to its experiences and its anticipations. The footnotes to change elaborated in this paper are much too fragmentary for such a task, but they imply some elements of a way of coming to understand change. They argue for considering the fundamental adaptive processes by which change occurs in terms of a broader set of theoretical ideas about organizational action. They emphasize exploring a few of the apparently anomolous dynamics of prosaic processes of adaptation. They focus attention particularly on the ways in which substantial changes occur as the routine consequence of standard procedures, or as the unintended consequence of ordinary adaptation. And they suggest that understanding organizational change requires discovering the connections between the apparently bizarre and the apparently mundane in organizational life.

FOOTNOTES

1. For example, Nelson and Yates (1978).

2. Blaug (1963), Freeman (1974), Jewkes, Sawyers, and Spillerman (1969), Little (1963), Mansfield (1968a), Nelson (1962), Shanks (1967), Utterback (1971).

3. Ames (1961), Arrow (1962), Branch (1974), Carter and Williams (1958), Grabowski and Baxter (1973), Hamberg (1966), Machlup (1962).

4. Corwin (1972, 1975), Evan and Black (1967), Fast (1979), Hage and Dewar (1973), Kennedy (1964), Layton (1972), MacLaurin (1953), Mansfield (1961, 1963, 1968b, 1971), Mulkay (1972), Normann (1971), Pincus (1974), Scherer (1965), Schmookler (1966), Sapolsky (1967), Shepard (1967), Steiner (1965), Stinchcombe (1974), Thompson (1965), Zaltman, Dunacan and Holbeck (1973), Zaltman (1973).

5. Abramowitz and Rosenfeld (1978), Baumol (1962), Collins (1979), Corwin (1973), Dubin (1959), Grabowski (1970), Haire (1959), Kaufman (1971, 1976), McNulty (1962), Starbuck (1965), Tsouderos (1955).

6. Aiken and Hage (1970), Alderfer (1976), Baldridge and Burnham (1975), Daft and Becker (1978), Downs (1976), Downs and Mohr (1976), Guest (1962), Hage and Aiken (1967), Kay (1979), Mohr (1969).

7. Cyert and March (1963), March and Simon (1958).

8. Manns and March (1978), Staw and Szwajkowski (1975).

9. Becker and Whisler (1967), Daft and Becker (1978), Kay (1979), Nelson (1959), Rowe and Boise (1974).

10. Gross, Giaquinta, and Bernstein (1971), Nelson and Yates (1978), Peterson (1975), Szanton (1978).

11. Bardach (1977), Pressman and Wildavsky (1973), Wildavsky (1979).

12. Attewell and Gerstein (1979), Eaton, March and Saetren (1980).

13. Hedberg, Nystrom, and Starbuck (1976), March (1978b).

14. See the references in footnotes 2, 3, 4, 5, and 6.

15. Alchian (1950), Nelson and Winter (1974), Penrose (1959), Winter (1964, 1971).

16. Carter (1971), Cyert and March (1963), Fellner (1961), Lindblom (1958).

17. Day (1967), Day and Groves (1975), Landau (1973), Nelson (1959), Steinbruner (1974).

18. Fliegel and Kivlan (1966), Peterson, Rudelius and Wood (1972), Rogers (1962), Rogers and Shoemaker (1971), Walker (1969).

19. McNeil and Thompson (1971), Stinchcombe, McDill and Walker (1968), White (1970).

20. Schelling (1978).

21. Hirschman (1970).

22. Weiner (1976).

23. Cyert and March (1963), March and Simon (1958).

24. Tversky and Kahneman (1980).

25. Hermann (1963), Mayhew (1979).

26. March (1978a).

27. Lave and March (1975).

28. Tversky and Kahneman (1974).

29. March and Olsen (1976).

30. See the discussion in Cyert and March (1963) and the subsequent literature cited above.

31. Daft and Becker (1978).

32. Kay (1979).

33. Cohen, March and Olsen (1972); Cyert and March (1963).

34. Daft and Becker (1978).

35. Rounds (1980).

36. Cyert, Dill and March (1958).

37. March and Romelaer (1976).

38. Zald and Denton (1963).

39. Messinger (1955). See also Sills (1957).

40. Krieger (1979).

41. Selznick (1949), Sproull, Weiner and Wolf (1978).

42. Clark (1956), Eckstein (1958), Krieger (1979), Selznick (1949), Simon (1955), Sproull (1977), Sproull, Weiner and Wolf (1978), Swerdlick (1977).

43. March (1972, 1978a).

44. Barzel (1968), Kamien and Schwartz (1972a, 1972b, 1975), Havrilesky (1972), Grabowski and Baxter (1973), Marris and Wood (1971), Mayr (1963), Mettler and Gregg (1969), Wilson and Bossert (1971).

45. Lave and March (1975).

46. Nisbet and Ross (1980), Slovic, Fischhoff and Lichtenstein (1977), Tversky and Kahneman (1971, 1974).

47. Weick (1979). See also Pfeffer and Salancik (1978), Meyer and Rowan (1977).

48. Argyris (1965), Baldridge and Deal (1975), Bennis (1966), Berman and McLaughlin (1978), Burns and Stalker (1961), Coch and French (1948), Edlefson (1975), Estler (1977), Ginzberg and Riley (1957), Havelock (1971), Lippitt, Watson and Westley (1958).

49. Aldrich (1979), Child (1972), Dill (1962), Harvey and Mills (1970), Lawrence and Lorsch (1969), Pfeffer and Salancik (1978), Starbuck (1976), Thompson (1967).

50. Baty, Evan and Rothermel (1971), Benson (1975), Evan (1966).

51. Barnard (1938), March and Simon (1958), Simon (1947).

52. Hirschleifer and Riley (1979).

53. Downs (1967).

54. Deutsch and Singer (1964), Waltz (1964).

55. Koopmans (1957).

56. Wright (1978).

57. Barkow (1978), Nielsen and Hannan (1977), Wilson (1975).

58. Freeman and Hannan (1975), Hannan and Freeman (1977).

59. Nisbet and Ross (1980).

60. Pfeffer (1979), Reed (1978).

61. Arrow (1974).

62. Mayr (1963), Mettler and Gregg (1969), Wilson and Bossert (1971).

63. Hirshleifer and Riley (1979).

64. Cyert and March (1963).

65. Knight (1967).

66. Elliott (1971).

67. Wilson (1966). See also Slevin (1971).

68. Manns and March (1978), Staw and Szwajkowski (1975).

69. Mansfield (1968a, 1968b, 1971).

70. Kay (1979).

71. Daft and Becker (1978).

72. Cohen and March (1974).

73. Christensen (1976), Edelman (1964), Kreiner (1976), Pfeffer (1979).

74. Daft and Becker (1978).

75. March (1978a).

76. Cohen, March and Olsen (1972).

77. Cohen and March (1974), March and Olsen (1975).

78. Olsen (1976).

79. Elster (1979), March (1978a).

80. Lindblom (1977), Williamson (1975).

81. Cohen and March (1974), March and Olsen (1976), Weick (1976, 1979).

82. March (1978b).

83. Cohen and March (1974).

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